

Naval Health Research Center

Quarterly Update

4th Quarter

Fall 2009

CAREN - Computer Assisted Rehabilitation Environment



Readiness Through Research and Development



1959

50 Years of Excellence

2009



Naval Health Research Center

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Capt. Kerry Thompson
Commanding Officer

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Command Corner

Recently I had the opportunity to travel to NMRC to attend the change of command ceremony from CAPT Daniel to CAPT Haberberger. Please take a moment to read about CAPT Haberberger, the new Commanding Officer of NMRC.

Captain Richard L. Haberberger, Jr., a native of East St. Louis, Illinois, received his B.S. in Biology from Rockhurst College in 1973. He received his M.S. in Biology (Microbiology) from University of Louisiana at Monroe (Northeast Louisiana University) in 1975 and his Ph.D. in Community Health (Epidemiology) from Southern Illinois University, Carbondale, Illinois in 1983. He completed an Executive M.B.A. through Colorado Technical University awarded in February 2006.

In 1983, CAPT Haberberger received a direct commission in the U.S. Navy as a Lieutenant in the Medical Service Corps. He was assigned as a staff scientist to the Naval Biosciences Laboratory in Oakland, California. In June 1986 he transferred to the U.S. Naval Medical Research Unit No. Three, Cairo, Arab Republic of Egypt as Head, Bacteriology Division. He was promoted to Lieutenant Commander in the summer of 1990 while serving as the Head, Pathogens Characterization Laboratory at the Naval Medical Research Institute, Bethesda, Maryland. He was assigned to the National Naval Medical Center, Bethesda, Maryland from 1992 through 1994, where he served as the Head, Microbiology Section, Pathology Laboratory. In 1995, LCDR Haberberger was transferred to the Naval Medical Center, San Diego, where he served as the Head, Microbiology Division. He was promoted to the rank of Commander in April of 1995. While

assigned to NMC, San Diego, he was sent on temporary duty to Prince Sultan Air Base, Al Kharg, Saudi Arabia as the Head of the Navy Forward Deployable Laboratory from September 1997 through February 1998. He was selected as the Executive Officer, U.S. Naval Medical Research Unit No. Three from April 1998 through May 2001. In 2001 CDR Haberberger was promoted to the rank of Captain. In May 2001 he was assigned as Navy Medical Research and Development Liaison to the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland. In June 2002 he was appointed as the Navy Armed Services Biomedical Research and Evaluation Management (ASBREM) Committee Secretary (ASEC). Also in June 2002, CAPT Haberberger was selected to be a Navy Representative to the Congressionally Directed Peer Review Medical Research Program (PRMRP) administering over \$40 million in Congressional grants annually. In November 2002, the Navy Surgeon General appointed him the Medical Service Corps Microbiology Specialty Leader for Navy Medicine. In April 2003, he was selected as the Executive Officer of the Naval Medical Research Center, Silver Spring, MD.

In November of 2008, CAPT Haberberger was selected to be the next Commanding Officer of the Naval Medical Research Center and Director of the Naval Medical Research and Development enterprise, which includes nine U.S. Navy biomedical commands and detachments worldwide. He assumed command on August 21, 2009. ♦

*Condensed version of CAPT Haberberger's bio.
For the complete version, visit
www.med.navy.mil/sites/nmrc/Pages/CO_bio.htm*

NHRC in the News

Combat linked to higher blood pressure - United Press International, 16 Sep 2009

Swine flu is more contagious than first thought - Examiner San Diego, 15 Sep 2009

Abbot Wins Top Honor in Wall Street Journal Technology Innovation Awards - Reuters, 15 Sep 2009

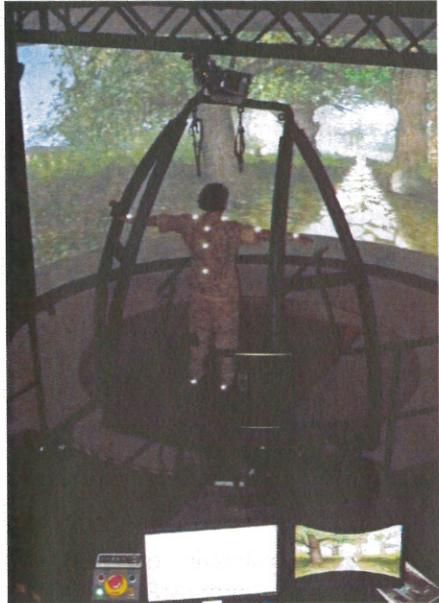
Troops in the Field at Risk for Hypertension - Medpage Today, 14 Sep 2009

Battling swine flu: New technology from Abbott Laboratories unit works to detect H1N1 - Chicago Tribune, 7 Sep 2009

The Wall Street Journal 2009 Technology Innovation Awards - Wall Street Journal, 13 Sep 2009

FLU NEWS FROM ICAAC: H1N1 studies, IV peramivir findings, Tamiflu for H5N1 - CIDRAP, 14 Sep 2009 ♦

CAREN Lab Opens at NHRC



Use of Virtual Technologies in Advanced Rehabilitation and Warfighter Performance Research

The term virtual reality, or VR, conjures up character images from science fiction movies, escaping the world around them and embarking on something of fantasy. Today's technology allows researchers and medical providers to utilize VR to immerse an individual into a simulated scenario where interactions with that scene will occur to achieve rehabilitation goals and evaluate human performance in a realistic but safe, laboratory setting.

In the research setting, immersion can provide the link from sterile laboratory testing to "real world" applications. The Human Performance Lab at NHRC has recently finished the installation of a Computer Assisted Rehabilitation Environment (CAREN). NHRC's CAREN is the 7th in the world and 3rd in the United States, all of which reside at DoD facilities. The other CAREN facilities reside within the Walter Reed Army Medical Center's Military Amputee Training Center and the Brooke Army Medical Center's Center for the Intrepid. Both of the Army facilities primarily utilize the CAREN as a clinical rehabilitation tool.

The CAREN works in real-time enabling the creation of different experiments in controlled and repeatable environments by using different VR principles. These principles provide a unique reactive virtual experience for the user, including visual, auditory, vestibular, and tactile sensory inputs. The system consists of a nine foot diameter platform that sits upon six hydraulic actuators that can be programmed to move in any direction (yaw, pitch, and roll up to 25°) independently or simultaneously. A split belt treadmill runs the length of the platform with an independent integrated force plate under each belt. Body movements are acquired by a 10 camera motion capture system. The system is surrounded by an 8ft tall, 180° screen whose images are synchronized with movement of the platform and input from the user. The CAREN is much like a flight simulator, but instead of flying a plane, the individual physically navigates their body through a virtual world.

NHRC will conduct research and advanced develop-

ment work with the CAREN system in several ways. One key R&D area will involve accelerated rehabilitation research, and research on effectiveness of various prosthetics. These studies will be conducted in a joint manner with WRAIR and the Center for the Intrepid. Another area involves studies examining physical and cognitive performance under high combat load conditions. Studies are needed that can determine the extent of these decrements, and identify ways of mitigating or minimizing the deficits. Finally, the CAREN platform may be useful in identifying subtle forms of Traumatic Brain Injury through careful analyses of gait and/or electroencephalograph data. Ironically, most of what is understood about the brain and its subsystems has been derived from humans in seated or supine positions via EEG and fMRI recordings. In collaborative work with the University of California - San Diego, it may soon be possible for EEG to be accurately recorded in a person walking through a virtual space (like the CAREN system), and thus provide a more precise way of studying brain system asynchronies due to TBI or other insults.

Virtual environments have been very successful and well received by patients in the military rehabilitation setting. As a rehabilitation tool, virtual environments are extremely motivating for service members who have grown up in an age of video games and high-graphic computer technology. In the Warfighter Performance Department, we intend to move beyond the rehabilitation setting and utilize the virtual environment capability to bridge the gap between the experimentally controlled, but unrealistic laboratory setting with the confounds and safety issues that occur directly in the field. ♦



Spread the Word, Not the Germ...

Increasing the awareness of seasonal influenza and H1N1 for the health and well being of NHRC staff and family is one of our highest priorities.

Immunization is the primary method of reducing seasonal illness. Early preparation can limit the effects of the H1N1 flu.

- Get immunized
- Cover your mouth when you cough
- Wash your hands

General information of seasonal influenza can be found at
<http://www.cdc.gov/flu/>

50th Anniversary Event



CAPT Kerry Thompson

staff attended this event. Among the speakers were John Rasmussen, CAPT MSC USN (Ret.), Paul Nelson, CAPT MSC USN (Ret.), and VADM Harold M. Koenig USN (Ret.), M.D.

Dr. Rasmussen's speech entitled "Founding of the Laboratory" talked about the history of the lab, how it was conceived, located in Point Loma, and funded with only \$30,000 in research funds and had to be supplemented from various sources. In 1957, while visiting San Diego's training centers and hospitals, CAPT Rasmussen (BUMED) remarked to the Navy's Chief of Psychiatry, Dr. George Raines, that the Navy's research program "was less than adequate." Two years later, in 1959, NPRU was established.

Dr. Nelson's speech titled "The House that Walt Built" was based on Dr. Walter Wilkins and his influence to the continued success of NPRU/NHRC. Dr. Wilkins, one of the original members of the Surgeon General's consultant

Naval Health Research Center (NHRC) celebrated its 50th anniversary on 24 July 2009 at Admiral Kidd Club, San Diego. Former Navy Psychiatric Research Unit (NPRU) and NHRC



Dr. Walter Wilkins



NPRU/NHRC 50 years



Paul Nelson, CAPT MSC USN (Ret.)



John Rasmussen, CAPT MSC USN (Ret.)

panel, was the founding Scientific Director of NPRU and is remembered for his skills as a leader and mentor. He had high hopes and aspirations for NPRU/NHRC and helped many young scientists develop their full potential. To a large extent, it was Dr. Wilkins skill as a scientific leader which permitted NHRC to make the transition from a narrowly focused neuropsychiatric research laboratory to the Navy's major biomedical facility of today. Today, Dr. Wilkins is honored and remembered by the annual Wilkins Award for Excellence in Biomedical Research.

VADM Koenig (Ret.) presented the Wilkins Award to Michael Broderick, Christian Hansen, and CAPT Kevin

Russell for their publication entitled Exploration of the Effectiveness of Social Distancing on Respiratory Pathogen Transmission Implicates Environmental Contribution, published in the Journal of Infectious Diseases, 2008, 198, pp. 1420-1426.

The ceremony was attended by members of the staff representing every decade of the lab's existence. In a letter to CAPT Thompson, the 34th Mayor of San Diego, Jerry Sanders proclaimed 24 July 2009 to be "Naval Health Research Center Day" in the city of San Diego to honor and acknowledge outstanding innovations in medical research and development. Congresswoman Susan Davis (D-CA) sent a letter of congratulations along with a United States flag flown over the nation's capital. ♦



CAPT Mitchell Dukovich & Dr. Karl Van Orden

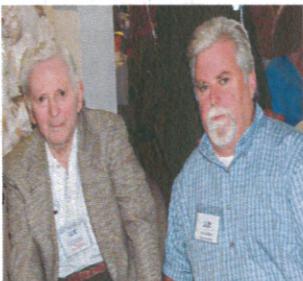


Walter Wilkins' Family

50th Anniversary Event



Dr. Paula Konoske,
CAPT Kerry Thompson



Dr. Gunderson and
John Gunderson



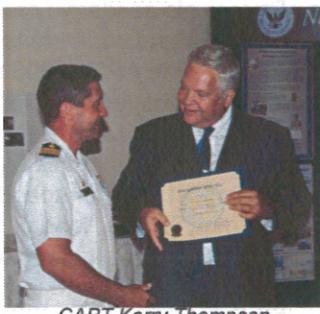
CDR Marcella McCormack, Dr. Larry Dean and
Mrs. Dean, CAPT Thomas Contreras (Ret.)
and Mrs. Contreras



Dr. Frank Garland



George Seymour, Janet Fry
1965 SDSU Students



CAPT Kerry Thompson,
Dr. Cedic Garland



Lesley Henry,
Dr. Besa Smith



Jessie Hascall, Genieeah Padilla, CDR Todd Sander, Chris Henson



Dr. Ross Vickers,
CDR Tom Berhage (Ret)

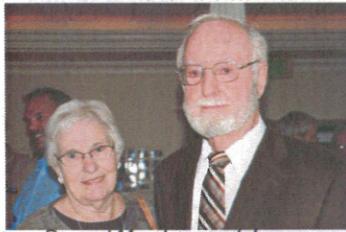
Charles Jackson, Brian Nelson



CAPT Kerry Thompson, LCDR Claro Garcia



CAPT Don Sine (Ret),
Jan Dickieson



Dr. and Mrs. Lavern Johnson



CAPT Gregory Utz



Mrs. Rubin, Dr. Richard Rahe, Brenda Crooks, Dr. Robert Rubin



Mary Aldous,
Dr. and Mrs. Mike Congleton



CDR Guy Banta (Ret), Mrs. Banta,
Jay Heaney

SPOTLIGHT



NHRC welcomes Douglas Christian Johnson (AKA Chris) to the Warfighter Performance Department. He is a Research Psychologist, and we are looking forward to the many attributes he brings to NHRC. Read more about Chris below.

Dr. Chris Johnson is a 10 year veteran of the United States Coast Guard, where he served as both as an enlisted and commissioned officer. He is a 1993 graduate of the United States Coast Guard Academy in New London, Connecticut. Chris earned his Ph.D. from UCLA, with specializations in clinical and cognitive psychology. At the UCLA Anxiety Disorders Research Center (ADRC) he focused on memory and information processing biases associated with state anxiety and anxious personality traits. Chris completed an APA accredited internship VA Los Angeles Ambulatory Care Center. Following internship, Chris completed two-years of post-doctoral training at Yale University School of Medicine and the National Center for PTSD, Clinical Neurosciences Division. At Yale Chris served on faculty at the level of Associate Research Scientist, and engaged in research related to psychological resilience and cognitive functioning under stress. From

Yale, Chris received a joint appointment to the Department of Psychiatry at UCSD School of Medicine, and the VA San Diego. While at the VA, he served as the lead psychologist for the PTSD Assessment and Treatment Clinic at the North County Community Based Outpatient Clinic. Most recently Chris served as the Department Head for Research Facilitation at the Naval Center for Combat Operational Stress Control (NC-COSC), located at Naval Medical Center San Diego. As a plank-owner with the newly established center, Dr. Johnson helped establish a program of clinical research in collaboration with Navy clinicians treating combat stress related mental health issues. Prior to his academic career, Dr. Johnson served as a psychologist and counterintelligence analyst with the FBI, and was the APA's 2006 research fellow with the DOD's Counter Intelligence Field Activity (CIFA). Chris continues to live in Oceanside where he continues a Semper Paratus life, 'always ready' for any event that involves swimming, sailing, surfing, or spending time in the water. Dr. Johnson met his wife, Linda, while at the Coast Guard Academy, and they have been married for 17 years. The Johnson's have one son, age 5, and two daughters, ages 6 and 2. ♦

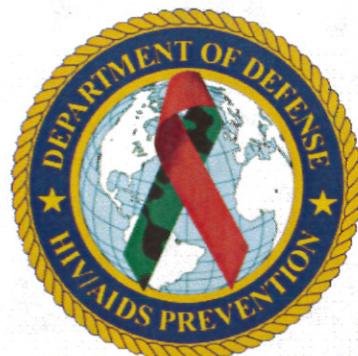
Letter from Commander, AFRICOM

On July 8th 2009, General William E. Ward wrote the following letter to the Assistant Secretary of Defense for Health Affairs, Ms. Ellen Embrey expressing his sincere appreciation for the outstanding support of the DoD HIV/AIDS Prevention Program (DHAPP) provides to U.S. Africa Command. The following is an excerpt taken from the letter:

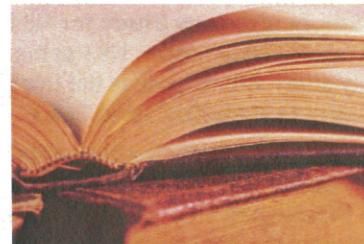
"Your DHAPP team and their efforts are a positive force for many of our Command's engagement efforts on the African continent. DHAPP, through a partnership with host nation militaries, U.S. Government agencies, and private entities, developed and implemented a powerful and sustainable set of military-to-military partnerships in 44 countries in Africa. Just as important, many of these DHAPP programs serve as the primary foundation for other priority military-to-military engagement opportunities with these same partner nations. Most importantly, DHAPP-supported military HIV programs in many African countries affect the nation facilities are often some of the best and, in some cases, the only facilities available in a geographical area. In light of DHAPP's importance to furtherance of both our and our partner nation's goals, we will pursue additional funding for our African military partners through the Coordinating Board for DoD Global HIV/AIDS

prevention in foreign militaries and the President's Emergency Plan for AIDS Relief (PEPFAR).

As DHAPP is an instrumental component of my Theater Security Cooperations (TSC) effort, I hope to see your team's continued active participation in our TSC Working Groups to assist us in the development and implementation of initiative. I am proud to have DHAPP on the Africa Command team and look forward to your continued outstanding contributions." ♦



Recent Publications



Endara SM, Ryan MA, Sevick CJ, Conlin AM, Macera CA, Smith TC. Does acute maternal stress in pregnancy affect infant health outcomes? Examination of a large cohort of infants born after the terrorist attacks of September 11, 2001. *BMC Public Health*. 2009 Jul 20;9:252.

Gorham ED, Barrett-Connor E, Highfill-McRoy RM, Mohr SB, Garland CF, Garland FC, Ricordi C. Incidence of insulin-requiring diabetes in the US military. *Diabetologia*. 2009 Oct;52(10):2087-91.

Granado NS, Smith TC, Swanson GM, Harris RB, Shahar E, Smith B, Boyko EJ, Wells TS, Ryan MA; for the Millennium Cohort Study Team. Newly Reported Hypertension After Military Combat Deployment in a Large Population-Based Study. *Hypertension*. 2009 Sep 14. [Epub ahead of print]

Jacobson IG, White MR, Smith TC, Smith B, Wells TS, Gackstetter GD, Boyko EJ; Millennium Cohort Study Team. Self-reported health symptoms and conditions among complementary and alternative medicine users in a large military cohort. *Annals of Epidemiology*. 2009 Sep;19(9):613-22.

Larson GE, Booth-Kewley S, Highfill-McRoy RM, Young SY. Prospective analysis of psychiatric risk factors in marines sent to war. *Military Medicine*. 2009 Jul;174(7):737-44.

MacGregor AJ, Corson KS, Larson GE, Shaffer RA, Dougherty AL, Galarneau MR, Raman R, Baker DG, Lindsay SP, Golomb BA. Injury-specific predictors of posttraumatic stress disorder. *Injury*. 2009 Sep;40(9):1004-10.

Metzgar D, Baynes D, Hansen CJ, McDonough EA, Cabrera DR, Ellorin MM, Blair PJ, Russell KL, Faix DJ. Inference of antibiotic resistance and virulence among diverse group A Streptococcus strains using emm sequencing and multilocus genotyping methods. *PLoS One*. 2009 Sep 4;4(9):e6897.

Metzgar D, Skochko G, Gibbins C, Hudson N, Lott L, Jones MS. Evaluation and validation of a real-time PCR assay for detection and quantitation of human adenovirus 14 from clinical samples. *PLoS One*. 2009 Sep 17;4(9):e7081.

Smith TC, Leardmann CA, Smith B, Jacobson IG, Ryan MA. Postdeployment hospitalizations among service members deployed in support of the operations in Iraq and Afghanistan. *Annals of Epidemiology*. 2009 Sep;19(9):603-12. ♦

Highlights from the lab

Yokosuka and Guam Visit

CAPT Thompson and CDR Blair returned from a visit to NH Yokosuka, NH Guam and with the 7th Fleet Surgeon to discuss the current capability and infrastructure needed to better serve the shipboard Influenza-Like Illness (ILI) program as well as support to the regional MTF's in the Pacific. We will be working to establish a MOU with NH Yokosuka for space to conduct our testing and sample collection for 7th Fleet and will be exploring if NH Guam is a viable site for sample collection as well. During this trip, we also met with CAPT D. Lane re: a clinical trial of a triple combination drug therapy for influenza which may involve Tripler AMC. A visit was also made with Senator Akaka of Hawaii at his request to better understand all the clinical trial sites for this drug in Hawaii since the trial is congressionally funded. Four separate hospitals are being considered for participation from Hawaii.

ATACCC Presentation

Dr. Troy Holbrook and Mike Galarneau presented a paper at Advanced Technology Applications for Combat Casualty Care. The paper was titled, "An Examination of Point of Injury Patient Transport Characteristics on Clinical Outcomes." The session was well attended and audience members included representatives from the US Army, Special Operations Command, US Army Medical Research & Materiel, Institute of Surgical Research / Joint Theater Trauma Registry, and Technical Committee on Computer Communications.

Evaluation of Prosthetic Device

Evan Johnson, at the Human Performance Lab Swim Flume, conducted a trial to examine the efficacy of a prosthetic device designed for swimming and diving by an active duty Navy diver with a trans-tibial amputation. This collaborative effort included CAPT Helmers from NMCSD and CDR Sander, LT Bartlett and Dr Pinata Sessions from NHRC.

New Helmet-Mounted Blast Sensors

Jerry Larson, Mike Galarneau, and Will Sattley participated in a VTC chaired by Dr. John F. Glenn (SES Director, USAMRMC) and attended by representatives from the Joint Chiefs of Staff, Marine Corps, Air Force, and numerous Army agencies. The purpose of the meeting was to review progress in the validation of helmet-mounted blast sensors, a project that is a high priority for Admiral Mullen (Joint Chiefs), the Army Vice Chief, and the Assistant Commandant for the Marine Corps. Data gathered to date indicate that, while there are many irregularities in the performance of the sensors, initial results are promising enough to justify development of 2nd generation devices. NHRC's role in this project is to advise on and participate in the use of medical data as part of the validation process.

Highlights from the lab (cont.)

Shipboard Crew Study for N81

Paula Konoske visited N81 at the Pentagon in Washington, DC, to present initial findings related to the Shipboard Crew Casualty study and to discuss the use of those casualty streams in another N81 funded project evaluating shipboard medical capabilities using TML+.

Institute of Medicine Presentation

Dr. Cedric Garland gave an invited presentation to the Institute of Medicine, National Academy of Sciences, entitled "Cancer" in Washington DC. The IOM is deciding on revisions to the recommended daily intake (adequate intake) of vitamin D and calcium and the upper levels for intake.

US Army Armor/Anti-Armor Threat Coordination Meeting

Mike Galarneau, Will Sattley and Sherri Winchester attended the US Army Armor/Anti-Armor Threat Coordination Meeting as members of the Trauma and Prevention of Injury in Combat consortium in Charlottesville, VA. They presented analyses of selected Navy-Marine Corps Combat Trauma Registry Deployment Health Database injury cases and participated in panel discussions to overview operational armor and design requirements from a medical perspective.

Small-Pox Vaccine Study

Deployment Health Department received a letter from Ellen Embrey, Health Affairs, regarding the DOD's ACAM2000 smallpox vaccine post-licensure study. In the letter, Ms. Embrey states NHRC's Deployment Health Department has been selected as the organization to administer the official smallpox vaccine's myo/pericarditis registry.

Senior Health Officials from Mexico visit NHRC

NHRC scientists hosted Dra. Ethel Palacios Zavala, the Senior Program Coordinator for International Projects, Ministry of Health, Mexico and Dra. Rita Flores Leon, Laboratory-Epidemiology Liaison, General Directorate of Epidemiology, National Public Health Laboratory, Mexico during meetings at NHRC that included the US CDC to discuss ongoing surveillance and laboratory diagnostics. With assistance from the US State Department's Biological Enhancement Program, the US/Mexico team looks to deepen their scientific collaboration through augmented surveillance and advanced diagnostic training over the next year. Both sides recognized the importance of this unique relationship during the early stages of the novel pandemic Influenza A/H1N1 outbreak when NHRC analyzed samples for their Mexican counterparts and Mexican health officials provided critical clinical and epidemiological information on the budding epidemic.

VA Science Advisory Board

Dr. Jerry Larson participated in the first annual meeting of the Science Advisory Board for the San Diego VA's Center of Excellence for Stress and Mental Health. Dr. Larson and other members of the Advisory Board reviewed a number of current projects; inspected research facilities utilized by the Center, and provided recommendations for maximizing the Center's impact within the VA and elsewhere. ♦

New NMSC Commander and Chief MSC



The new NMSC commander, RDML Eleanor V. Valentin, MSC, relieved Chief of the Dental Corps, RDML Richard C. Vinci at the change of command ceremony held at NAS Jacksonville on Sept 18. RDML Valentin reports from Navy Medicine National Capital Area (NMNCA) in Bethesda, Md., where she served as Chief of Staff since May 2008. She will assume duties

as Chief of the Medical Service Corps on Oct. 1, a position she will hold simultaneously as NMSC commander. RDML Vinci has commanded NMSC and simultaneously served as Chief of the Dental Corps since Nov. 2007. He will report to the Chief, Bureau of Medicine and Surgery in Washington, DC, as the Deputy Chief BUMED for installations and logistics, and will continue to serve as the Dental Corps director. NMSC is one of four echelon-3 regional commands in Navy Medicine, each commanded by a flag officer. NMSC manages all of Navy Medicine's environmental, population

and public health; research and development; information management and technology; supply, logistics, purchasing and contracting; and manpower, personnel, education and training. NMSC has subordinate commands with more than 4,000 personnel in nine countries, 12 states and the District of Columbia. ♦



U.S. Navy photo by
Mass Communication
Specialist 1st Class (SW)
Arthur N. De La Cruz

Chief, BUMED, Vice Adm. Adam M. Robinson, Jr. MC, Chief of the Dental Corps, RDML Richard C. Vinci, RDML Eleanor V. Valentin, MSC, and Lt. J. Top, CHC salute the national flag during the NMSC change of command ceremony held on Sept 18.